

PROCEEDINGS
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THE COWHAGE AND RELATED SPECIES.

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In connection with economic investigations of the Florida Velvet Bean and other cultivated forms of *Stizolobium*, various related species characterized by having stinging hairs on the calyx and pods, have been studied both from growing plants and from herbarium material. The stinging hairs from one or more of these species were formerly used in medicine as an anthelmintic. This substance was known as cowhage, couhage or cowitch, the names also being applied to the plant which produces the substance. The medicinal use of cowhage as an anthelmintic was first recorded by Browne (Browne, Patrick. Civil and Natural History of Jamaica, p. 291. 1756) and later described in detail by Bancroft (Bancroft, Edward. An Essay on the Natural History of Guiana, pp. 390 et seq. 1769).

The name cowhage or cowitch is of East Indian origin, according to Watt (Watt, George. Dictionary of Economic Products of India, 5:286), a corruption of *kiwach* or *kiwanach*, the Hindu name of the plant. While the name is of East Indian origin, the official cowhage seems to have been secured wholly, or at least mainly, from the West Indian plant.

With few exceptions botanists have considered that there is but one species of cowhage, to which the name *Mucuna pruriens* is generally applied. The facts are far too complex to permit of such a simple disposition.

The pre-Linnaean history of the various plants referred to cowhage is much complicated, but at least three different plants were involved. Parkinson in 1640 described a cowhage from Surat, India, with black shining seeds. Morrison in 1680 de-

scribed a cowhage also from Surat, but with spotted seeds. A few years later Ray secured what was evidently this same spotted seeded plant from the East Indies. At first he regarded it as identical with Parkinson's black-seeded bean, but afterwards in deference to Plukenet's opinion, considered it distinct. Still later various botanists found and recorded cowhage-like plants in Ceylon, Java, Malabar and Amboina. In the West Indies similar plants were found in Jamaica and Barbados.

The generic name *Stizolobium* was proposed by Browne (Brown, Patrick. The Civil and Natural History of Jamaica, p. 290. 1756) and based on two species, namely, the common cowhage of Jamaica which Browne considered the same as one described from Ceylon by Burmann, and the "Smaller cowhage" of Jamaica, a plant which remains wholly obscure, but is probably merely a form of common cowhage. Browne did not use binomials, but his generic name *Stizolobium* has been accepted by various botanists in preference to *Mucuna*, among them Medicus (Medicus, Friedrich Casimir. Vorlesungen Churpf. Phys. Ges.); Persoon (Persoon, Christian Hendrick. Synopsis Plantarum, 2:298. 1807.); Kuntze (Kuntze, Otto. Revisio Generum Plantarum, 1:207. 1891.); and Hiern (Hiern, William Philip. Catalogue of the African Plants Collected by Dr. Friedrich Welwitsch, 1:250. 1896).

Stizolobium as here used, is distinguishable from *Mucuna* by the pods having neither wings nor plaits; by the relatively small seeds with thin testa; and by the short hilum. Two subgenera may be characterized as follows:

Hilum surrounded by a large caruncle; stems annual, herbaceous

Chialule

Hilum naked or with rudimentary caruncle; stems woody or half

woody **Brachyule**

Chialule includes *Stizolobium deeringianum* Bort, the Florida velvet-bean, and species with a similar hilum. *Brachyule* embraces *Stizolobium pruriens* and the following other species:

Stizolobium bracteatum KUNTZE, Rev. Gen. Pl. 208. 1891.

Carpopogon bracteatum ROXB. Hort. Beng. 54. 1814.

Mucuna bracteata DC. Prodr. 2:406. 1825.

S. comorense n. comb.

M. comorensis VATKE, Oestr. Bot. Zeitschr. 28:262. 1878.

S. sericophyllum n. comb.

M. sericophylla PERKINS, Frag. Fl. Philipp. 1:86. 1904.

- S. coriaceum* KUNTZE, Rev. Gen. Pl. 207. 1891.
M. coriacea BAKER in Oliver Fl. Trop. Afr. 2:187. 1891.
S. axillare n. comb.
M. axillaris BAKER, Journ. Linn. Soc. 22:465. 1887.
S. rhynchosoides n. comb.
M. rhynchosoides TAUB.; Engl. Bot. Jahrb. 23:194. 1897.
S. poggei HIERN. Cat. Welw. Afr. Pl. 1:252. 1896.
M. poggei TAUB.; Engl. Bot. Jahrb. 23:194. 1897.
S. melanocarpum KUNTZE, Rev. Gen. Pl. 208. 1891.
M. melanocarpa HOCHST. in A. Rich. Tent. Fl. Abyss. 1:215. 1847.
S. stans KUNTZE, Rev. Gen. Pl. 208. 1891.
M. stans WELW. in Oliver Fl. Trop. Afr. 2:186. 1871.
 ?*M. erecta* BAKER, Kew Bull. 65. 1895.
S. mollissimum n. comb.
M. mollissima KURZ, Journ. As. Soc. Bengal 43.² 187. 1874.

STIZOLOBIUM PRURIENS (L.) MEDICUS, Vorles. Churpf. Phys. Ges. 2:399. 1787.

Dolichos pruriens L. Syst. Nat. Ed. 10:1162. 1759.

Mucuna pruriens DC. Prodr. 2:405. 1825.

Linnaeus' name is based on the description and plate of Rumphius' *Cacara pruritus* (Herbarium Amboinense 5:393. tab. 142. 1747.) and therefore the species must be the plant native to Amboina.

No herbarium material has been found in any of the great herbaria that can possibly be the plant of Rumphius. Upon the writer's request, Dr. J. C. Konigsberger, Director of the Botanical Garden at Buitenzorg, Java, has succeeded in obtaining mature pods of the cowhage native to Amboina, and these prove to be identical with the plant common in the Philippine Islands. From ample Philippine material, the following description is drawn. The species belongs to the section *Brachyule* and is at once distinguished by the seeds from *S. prurimum*.

Annual vine twining to a height of several meters; stems terete, somewhat angled or striate longitudinally, sparsely pubescent with short stout retrorse hairs; leaflets plane, rather firm when mature, ovate, the lateral oblique, mostly obtuse, commonly cuspidate pointed, sparsely appressed pubescent on each side, paler beneath; raceme pendent, densely flowered, 10 to 30 cm. long; flowers dark purple; pedicels slender, 5 to 10 mm. long; calyx scarcely saccate, densely appressed canescent without and within, armed on the exterior with numerous golden stinging hairs, the lobes acute; corolla 4 cm. long, the keel exceeding the wings, glabrous except the base of the wings which are densely short bearded on the lower edge near the base; pods slightly falcate, 8 to 11 cm. long, compressed, 15 to 18 mm. broad and half as thick, 5 to 7-seeded, distinctly constricted between the seeds, densely covered with reddish-brown appressed stinging hairs about 2 mm. long; longitudinal ridge obsolete or evident only on the basal half of the pod; seeds buff, densely speckled with dark brown, shiny, rhomboid-orbicular in outline, much compressed,

10 to 12 mm. long, the linear hilum $\frac{2}{3}$ as long and surrounded by a very low black caruncle.

Fort McKinley, Rizal Province, Luzon, P. I. *Merrill* No. 6348, September, 1908; also "cultivated at Manila"; Montalban, Rizal Province, Luzon, P. I. *C. B. Robinson*, No. 9648, January 23, 1910; *Merrill*, March 10, 1906; Laguna Province, P. I., *C. B. Robinson*, March 5-11, 1910.

All of the above material is in the Philippine Bureau of Science. In the Herbarium of the Botanical Garden at Berlin is additional material as follows:

Philippines: Montalban, *Warburg* No. 12,585; Mt. Merivales, *Warburg* No. 12,897.

Celebes: Minahassa, *Koorders* No. 17,639B in 1897.

This species is closely allied to *Stizolobium sericophyllum* (Perkins) which has similar pods and seeds, but with thickish densely soft pubescent leaves, the pubescence not appressed. The constrictions between the seeds form nearly complete partitions within the pod.

Through the Office of Seed and Plant Introduction this species has been introduced as follows, the seeds collected by the writer: S. P. I. 31,602 from La Carlota, Negros; No. 31,603 from Bosoc, Negros; and No. 31,604 from Alabang, Luzon, all in the Philippine Islands. Seeds of what is apparently the same species were received from Medan, Sumatra (S. P. I. No. 26,663) but these failed to germinate.

The plant is not strictly annual, but dies after fruiting. Growing plants in Florida lived three years without blooming.

STIZOLOBIUM PRURITUM (WIGHT) n. comb.

Mucuna prurita WIGHT in Hooker, Botanical Miscellany, 2: 348. 1831.

The original description is as follows:

"*Mucuna prurita*; floribus thyrsoides, leguminibus oblongo-curvatis compressis ecarinatis urentibus, foliis subtus hirsutis, intermedio rhomboideo obtuso, lateralibus extus dilatis. (Suppl. Tab. XIII.)

"*Carpopogon pruriens*. *Roxb. Hort. Beng. p.* 54.

"*Dolichos pruriens*. *Roxb. Drawing in Mus. of E. Ind. C. n.* 284. (an *Linn et alior*).

"*Stizolobium pruriens*. *Spreng. Syst. Veget. v.* 3, p. 252?

"Nai Corana. *Rheed. Malab. v.* 8, p. 61. t. 35.

"Cacara pruritus. *Rumph. Amb. v.* 6. p. 393. t. 142.

"Pooneposikie. *Tamul*.

"*Stems* suffruticose, twining, branched; *branches* rounded, hairy. *Petioles* much enlarged at the base, 6-8 inches long, cylindrical, hairy. *Leaves* ternate, middle leaflet rhomboid, or rhomboideo-elliptical, obtuse, mucronate; lateral ones much dilated on the outside, and also mucronate; on short, thick, rusty, tomentose stalks; above nearly glabrous, below silvery, from short appressed white hairs; the veins very prominent beneath. *Stipules* filiform-subulate, those of the leaflets much smaller than the others. *Racemes* peduncled, axillary, pendulous, much shorter than the petioles, thyrsoid. *Flowers* large, purple. *Pedicels* in threes, short, arising from a small thick tubercle. *Calyx* pubescent, 2-lipped; upper lip entire, obtuse; under one 3-cleft, the lobes acute. *Corolla*:

Vexillum not half the length of the keel, varying in colour from dirty-white to pale purple; *Wings* shorter than the keel, dark purple; *Keel* cylindrical to near the end, where it suddenly curves upwards, and terminates in a sharp spinous point. *Stamens* diadelphous; *Anthers* alternately linear and globular. *Pistil*: *Germen* short, hairy; *Style* filiform, pubescent for its whole length; *Stigma* subcapitate. *Legume* 3-4 inches long, and bent at the extremities, three-fourths of an inch to an inch, or nearly so, broad, slightly compressed on the valves, not at all carinated, contracted between the seeds, and hence subtorulose, entirely covered with a thick coating of erect, white, prurient* hairs, which usually turn black in drying, and brown in maturity. *Seeds* 4-5, oval, separated by cellular partitions, not bound by a circular linear *hilum*, but attached to a large lateral *funiculus*.

“Found twining in hedges and among bushes, usually near water. In the neighborhood of Negapatam, it is common in sandy soil. It flowers during the rainy and cool seasons, and ripens its fruit about March. It may be considered, indeed, extensively distributed over India; but nowhere perhaps so abundantly as in the Presidency of Madras. The young pods are dressed and eaten by the natives.

“It would appear from a query of De Candolle, ‘‘an *Planta Americana eadem certe ac Indica?*’’ that there is some doubt as to the identity of the American and Indian plants named *Mucuna pruriens*; in my opinion not without reason, for I suspect De Candolle’s character is taken from the former, and Sprengel’s from the latter. The keeled legumes and acuminated leaves which distinguish the first are certainly at variance with my plant. On comparing my drawing with Woodville’s plate, Tab. CLXXIII, a very remarkable difference appears in the form of the racemes, and also in their size. The form of the segments of the calyx, in his figure, is very different from those of my plant; in his, they are represented as long, subulate teeth; in mine, they are short and triangular, with their upper segment nearly a correct triangle.

“(Upon a careful comparison of Dr. Wight’s figure and specimens, with the figure of Jacquin, (*Americ. t.* 122,) and American individuals in my Herbarium, both from St. Vincent and from Guiana, I am inclined to agree with Dr. Wight, and to consider the American and Asiatic species to be different. In our plant the leaves are smaller, the leaflets more obtuse (not acuminated), and the middle leaflet more truly rhomboidal, the flowers are more constantly in threes, and, what affords perhaps the best character, the pods are greatly broader, compressed, free from any raised line on the back of the valve, whilst in the American *M. pruriens* the pods are much narrower, terete, and keeled on the valves. Rumphius’ plate is very characteristic of our plant, and Jacquin’s is equally excellent as a representation of the American one; while Rheede’s is less happy, especially in the leaves. Under these circumstances, I trust Dr. Wight will approve of my giving the specific name already adopted in the Herbarium Amboinense, to designate the Eastern species. H.)”

Three characters are emphasized in this description, namely the shape of the calyx lobes, the form of the leaflets, and the absence of carina of keel on the back of the pod valve. The calyx differences referred to by Wight may be seen by comparing Woodville’s plate drawn from a plant in the Banksian herbarium, with the colored plate of Wight. There is considerable variation, however, in the calyx lobes of all the *Stizolobiums* which lack stinging hairs so that this character can not be relied upon for specific identification, the variation including both actual and relative

*The American *M. pruriens* is the famous Cowhage or Cow-itch, employed as a vermifuge in the West Indies.

length and the acuteness of the apex. The variation in the species with stinging hairs on the calyx and pods is of the same sort. In Woodville's plate the calyx-lobes are especially elongated, however, but this we suspect is in part an error of the artist. At least in no specimens examined are they quite so long and slender.

The leaf differences referred to are perhaps valid. In all the *Stizolobiums* the leaflets vary greatly in size dependent on the vigor of the plant or the relative amount of shade. While the apex of the leaves is usually acute or acuminate and mucronate, they may be obtuse and mucronate on the same plant, especially on small leaflets, but in the plant we take to be the same as Wight's they are mostly obtuse.

The most important character is the pod, the valves of which are said to lack the longitudinal keel or carina. In all the forms studied the keel is present in matured pods though absent in full-sized unripe pods. This fact gives rise to the suspicion that Wight was led to error by not possessing fully matured fruit.

In reference to this and other matter Dr. Otto Stapf writes under date of August 26, 1912, as follows:

"The Herbarium,
"Royal Botanic Gardens, Kew,
"26. 8. 12.

"The plant from which Wight's figure of *Mucuna prurita* (text) was prepared is undoubtedly from the Presidency of Madras. We possess the original drawing with the Tamil name written on in Tamil characters; but no locality is stated. As to the discrepancy between the name in the text and the plate Wight himself in a letter to W. Hooker of 5th March 1832 deploras it as regrettable, without, however, explaining how it came about. Very likely the plate was finished and struck off before Wight was quite clear about the distinctiveness of *M. prurita* from Asia and *M. pruriens* from America. From the letter referred to it also appears that Wight had originally another name for *M. prurita* in mind, but fell in with W. Hooker's suggestion, although somewhat reluctantly.

"We possess a specimen communicated by Wight to W. Hooker and written up as *M. pruriens* from 'Madras.' It is the plant figured in Hook. Bot. Misc. 11, (suppl. tab. XIII). There are two other specimens also from Wight, one with the Herb. Wight propr.' label and the other from the distribution set; but neither has ripe pods, so that your suspicion that Wight's description of the pods as being 'not at all carinated' was due to the pods being immature, is evidently well founded.

"As to your question (1) is the name *M. prurita* to be credited to Hooker or Wight? I am inclined to vote for Wight who is responsible for the publication. What Hooker did was antecedent to the publication and the utmost a sticker for historical justice could claim would be *M. prurita* Hook. ex Wight.

"Ad question (2), I would reply, the name *M. prurita* stands on the Madras plant, as described and figured by Wight. Even if it should turn out that Rumphius's *Cacara pruritus* is not *Mucuna prurita* Wight, from Madras, but another *Mucuna*, the rule of the conservation of the earliest specific epithet could not be invoked as *Cacara pruritus* is pre-Linnean."

The actual identity of Wight's plant is important from a nomenclatorial standpoint. There are three subspecies closely resembling his

plate, which are most easily separable by the seeds. One, very wide-spread, has the seeds gray marbled with black; the second is characterized by shiny black seeds, and the third by brown seeds. In Wight's plate the immature (?) seeds are represented as pale chestnut from which it might well be that his description is based on the brown-seeded plant. As a brown-seeded plant that we have cultivated for three years has the leaflets nearly always obtuse the conclusion seems justifiable that it is the same as that described by Wight. This was received from I. H. Burkill, Esq., Reporter of Economic Products of India, and said to be from wild plants growing in the neighborhood of Calcutta, S. P. I. No. 25,263. It has been grown in the greenhouse at Washington and two seasons at Biloxi, Miss., and Gainesville, Fla. At Biloxi it had barely matured pods when killed by frost December 6.

To Wight's description may be added: Mature pods 6 to 7 cm. long, subterete, falcate, covered with erect reddish-brown easily-deciduous stinging hairs, each valve of the pod with a strong, nearly central keel extending the whole length; seeds pale to dark brown, about 12 mm. long, 8 mm. wide, not much flattened, the caruncle white.

On immature pods the pubescence is at first greenish-yellow. Before maturity the hairs on each side of the keel turn reddish first so the pod has the appearance of being longitudinally striped with differently colored hairs.

Other lots of seed were received from Waliar, Malabar, India, No. 01,664 and Kistna, Madras, No. 01,668. Both proved indistinguishable from No. 25,263.

***Stizolobium pruritus officinale* n. subsp.**

Leaflets mostly obtuse, mucronate, paler and more pubescent beneath, usually about 10 cm. long; pods falcate, 6 to 7 cm. long, each valve strengthened by a longitudinal nearly central keel extending the entire length, and usually a secondary imperfect ridge near the distal end, the whole covered with erect reddish-brown hairs; seeds 10 to 12 mm. long, 6 to 8 mm. wide, not much flattened, the ground color gray, finely sprinkled with minute irregular brown specks and more or less marbled with black, especially on the back; caruncle white, prominent.

The type was grown from seed obtained from Dr. William Fawcett, Kingston, Jamaica, under S. P. I. No. 21,566 and cultivated in 1909 at Biloxi, Miss. The type specimen is preserved in the Economic Herbarium of the Bureau of Plant Industry.

On immature pods the hairs are yellowish and before ripening the hairs on the keel and margins redden first, so that there is the appearance of two longitudinal rows of pale hairs on each side.

This is the common cowhage of the West Indies, apparently native in America and the only form which does not seem distinguishable from the commonest East Indian form as well as from that generally distributed in Africa, Madagascar, India, and some of the Malayan Islands. As all of its close relatives are Old World plants there can be no question as to

its being endemic there. Its occurrence in Jamaica, Barbados and Guiana previous to 1769 as well as its present wide dispersal in the American tropics, suggest strongly that it is also native to the New World, though it is possible that it may have been intentionally introduced by man.

If we may rely on the testimony of Husbands, of Browne and of Bancroft, that the negro slaves used the plant medicinally, this may have been sufficient incentive for them not only to bring it from Africa but to carry it wherever they went in the American tropics. However, there is no evidence that the negroes in Africa did or do use the plant in a medicinal way. If such is the case no mention is made of the fact in numerous books of African botany and travel examined.

On the other hand, the plant was well known and long used medicinally by the natives of India, it being mentioned according to Watt (*Dict. Ec. Prod. India*. 5:286) in ancient Sanskrit works as an aphrodisiac, but its use as an anthelmintic was introduced in comparatively recent years.

Roxburgh (*Flora Indica* 3:283. 1832) however writes:

“Annual, twining. Racemes pendulous. Legumes armed with stinging hairs.

“*Dolichos pruriens*, Linn. *Supp.* 657. &c.

“*Naicorana*. Rheede. *Mal.* viii. t. 35.

“Teling.—*Doola gonda*. Sans.—*Murkuti*. *Atma goopta ro*

“*Kupikuchoo*. Beng.—*Alkooschee*.

“Common in hedges, in most parts of India. Flowering time the cold season. (I have never been able to learn that the natives of these parts of India, make any use of any part of this plant, except the hairs of the legumes which they do not use as a medicine, (vermifuge) but as an ingredient to help to poison wells. However its having been of late taken inwardly to destroy worms, proves that it is not that poison they take it for; and it is more than likely that the other plants employed for the same base end, are fortunately much less dangerous than those who employ them imagine. Indeed it is only the most ignorant superstitious Poligar Mountaineers who are known to attempt to poison water.”)

Ainslee (*Materia Medica* 1:93. 1826), Bentley and Trimen (*Medicinal Plants* 2:78), and Watt (*Dict. Ec. Prod. India* 5:286) all assert that the natives of India eat the young, tender pods. This seems very questionable, but several closely related cultivated species which lack the stinging hairs on the pods are thus eaten. These cultivated plants have by several botanists been considered to be only varieties of the cowhage.

The alternative supposition, namely, that the plant is native to the tropics of both hemispheres, remains. Engler (*Engler, Adolph. Sitzungsberichte der Preussischen Academie der Wissenschaften zu Berlin* 1905, 1:180-231) has discussed at length the plants that occur in the tropics of both the Old and New Worlds. Some of these plants, like the cowhage, have their close relatives only in the other hemisphere.

The list of plants common to the tropical America and Africa is a long one, and after excluding all species that may have been transported by ships, by ocean currents, by birds or by winds, there remain many for which none of these explanations can be accepted. The most satisfactory theory to Engler that will account for the facts is that there were for-

merly land connections or at least scattered islands between Brazil and Africa.

The supposition that the plants may at some former time have migrated by way of northeast Asia and northwest America, Engler considers untenable because most of the plants occurring both in Africa and America are not found in Asia.

In recent years the cowhage has been collected in many parts of the West Indian region. Specimens have been examined as follows:

- Jamaica, Constant Spring, *Churchill*, March 21, 1897;
- Cuba orientale, *C. Wright* No. 140;
- Porto Rico, *Sintenis* 2575, *Heller* 4403;
- Colombia, *Santa Marta*, *Smith* 638;
- Granada, St. Georges, *Broadway*, December, 1904;
- Venezuela, *Tovar*, *Fendler* 2200;
- Costa Rica, San Jose, *Hoffman* 47;
- Surinam, *Hostmann* 55;
- Brazil, *Riedel*;
- Santo Domingo, *Turpin*;
- Martinique, *L. Hahn* 446.

From the Old World six different lots have been cultivated under their introduction numbers as follows:

- 21,954 From the Department of Agriculture, Buitenzorg, Java, through Dr. M. Treub.
- 24,422 From the same source as the preceding.
- 25,753 From Calcutta, India, through Consul-General W. H. Michael, the seed purchased from a seedsman.
- 26,292 } From Coimbatore, India, through Rev. Geo. N. Thomssen.
- 26,293 }

Most of the herbarium material from India and Africa seems referable to this subspecies, but some specimens are aberrant, especially in pubescence. Very few specimens possess mature pods and without these there must remain doubt as to their precise identity.

***Stizolobium prurimum maculatum* n. subsp.**

Very similar to *S. prurimum officinale* but pods larger, 8 to 9 cm. long; young pubescence on the pod at first whitish, later turning pinkish and finally tawny, all of the hairs changing color simultaneously; seeds larger, distinctly compressed, gray, very densely speckled with black and having few or no black marblings.

The type specimen is in the Economic Herbarium of the Bureau of Plant Industry, grown at Gainesville, Florida, in 1912, from S. P. I. No. 25,725 secured from the State Gardens, Baroda, India, presented by B. F. Cavanaugh, Esq.

STIZOLOBIUM PRURITUM BIFLORUM n. comb.

Mucuna pruriens biflorum TRIMEN, Handbook Flora Ceylon 63: 1894.

Seeds black, shiny.

Trimen's original specimen from Batticaloa, Ceylon, is preserved in the herbarium at Perideniya and from it the following notes were taken. "Leaflets very silky beneath, 3-4 cm. long. Pods falcate, 5 cm. long, with a single stout rib extending from the tip nearly to the base, the whole pod covered with red erect stinging hairs. Seeds 5, black, shiny."

The specimen is from a rather weak plant as indicated by the small leaflets and the 2-flowered clusters, a common phenomenon on weak plants in the related species.

Identical with Trimén's plant are S. P. I. Nos. 26,183 and 29,907, both received through Maj. A. T. Gage, Royal Botanical Garden, Sibpur, Calcutta, India, and No. 24,935 from C. Driberg, Esq., Secretary, Ceylon Agricultural Society, Colombo.

Herbarium material of the same thing has been examined at the Royal Botanic Garden, Calcutta, as follows:

Perak, Straits Settlements, *L. Wray*, February, 1889, No. 3326. "Kumbang Kota."

Palkate 2000 Lohardryga, C. B. Clarke, October 30, 1883. (This probably means between Palket and Lohardaga, Bengal.)

Stizolobium microspermum n. sp. (*§ Brachyule*).

Stems twining to a height of 2-3 meters, annual, slender, terete, striate angled, retrorsely pubescent; leaves trifoliolate, the petiole pubescent like the stems, 6-10 cm. long; petiolules fleshy, pubescent, about 6 mm. long; leaflets ovate-lanceolate, the lateral oblique, acute, 4 to 10 cm. long, about equalling the petioles, the pubescence fine, appressed, denser and silky beneath; pods 5-seeded, 7 cm. long, with 2 complete or nearly complete longitudinal ridges, and constricted between the seeds; hairs rusty red, closely appressed, rather dense with silky sheen; internal partitions nearly complete; seed black or nearly so, oval, much flattened, 9 mm. long, 6 mm. wide, the hilum 6 mm. long, surrounded by a very small paler caruncle.

From the botanical garden at Buitenzorg, Java, S. P. I. Nos. 32,112 and 24,423, cultivated at Biloxi, Miss., Miami, Fla., and in the greenhouse at Washington, D. C. The type is a specimen of 32,112 grown at Miami, Fla., in 1914, and preserved in the Economic Herbarium of the U. S. Department of Agriculture.

Very closely related to *S. pruriens* but with much smaller pods and seeds.

Stizolobium venulosum n. sp.

Stems herbaceous, finely canescent; leaves trifoliolate; leaflets 5-8 cm. long, firm, ciliate, rather obtuse, cuspidate, nearly glabrous above, strongly reticulated and finely hirsutulous beneath, the veins prominent,

the central leaflet obovate, broadest above the middle, truncate or slightly rounded at base, the lateral ones obliquely ovate; inflorescence dense, about 20-flowered, the peduncle pubescent with dense erect hairs; calyx similarly pubescent and with numerous stinging hairs, the lobes acutish, about as long as the tube; corolla purple, 2.5 cm. long, the keel much exceeding the wings; extra-floral nectaries at base of pedicels oblong.

Taung-gyi, South Shan States, Burma, 5500 ft. alt., April 17, 1910, Capt. R. W. MacGregor, No. 1144, in Herb. Calcutta Bot. Garden (Type).

Szema Mts., Yunnan, China, No. 12,749A, Dr. Henry in 1899. The last has young pods 5 cm. long, densely covered with seal-brown stinging hairs.

The form of the extra-floral nectaries as well as the long keel suggests that this species is a close ally of *Stizolobium bracteatum* (Roxb.) Kuntze, but it apparently lacks the broad bracts of that species. The species probably belongs to § *Brachyule* as does *S. bracteatum*.

***Stizolobium forbesii* n. sp. (§ *Brachyule*).**

Stems herbaceous, terete, longitudinally striate-angled, appressed-puberulent; leaflets broadly ovate, rather obtuse, cuspidate, thin, membranous, sparsely appressed, puberulent on each side, especially beneath, about 15 cm. long; petioles puberulent as long as the leaflets; petiolules very pubescent, 5 mm. long; peduncles terete, densely puberulent; racemes dense, 15 to 40 flowered; calyx campanulate, densely sericeous without and within, 15 mm. long, and bearing a few red stinging hairs; calyx-lobes triangular, acute, longer than the tube, the ventral longest; corolla "albi-virescenti"; wings 6-7 cm. long, pubescent on the lower margin near the base; keel a little exceeding the wings, abruptly curved at tip; standard much shorter than the wings; pods 16 cm. long, 3 cm. broad, linear, compressed, nearly straight, the subacute tip slightly curved, the thickish valves bearing 3 or 4 coarse longitudinal ribs, 2 sub-marginal and 2 intermediate, the dorsal one wholly or partly obsolete, the other three complete, the whole pod densely covered with chestnut-red short erect hairs much like velvet; constrictions between the 6 or 7 seeds very slight; seeds smooth, chestnut-colored, shiny, much flattened, 12 to 17 mm. long, 8 to 9 mm. broad, the hilum black, linear, 7 mm. long and surrounded by a low black caruncle.

Timor Laut, *Forbes*, No. 3320B, November, 1883 (type in Herb. Kew).

Malay Archipelago, *Reidel*, comm. by Dr. A. B. Meyer, 1883. (Herb. Kew).

Larat Island, *Dr. M. Treub*, in 1893 (Herb. Buitenzorg).

Java, Kediri, *S. H. Koorders*, No. 23,040B, June 16, 1896 (Herb. Buitenzorg).

Kei Island, *Dr. M. Treub*, cultivated at Buitenzorg (Herb. Buitenzorg).

An interesting species whose nearest relative is *Stizolobium poggei* (Taubert) Hiern from Africa.

STIZOLOBIUM HIRSUTUM (WIGHT & ARNOTT) Kuntze, Rev. Gen. Pl. 203. 1891.

Mucuna hirsuta WIGHT & ARNOTT Prodr. Fl. Ind. Or. p. 254. 1834.

The original description is as follows:

"*M. hirsuta* (W. & A.) branches, petioles, racemes and under side of the leaflets hirsutely tomentose; leaflets ovate, upper side hirsutely pubescent; racemes drooping, long peduncled; floriferous part somewhat long; pedicels as short as the calyx; calyx-segments broadly lanceolate, acuminate, the length of the tube; legume linear, curved, very densely covered with rigid stinging hairs, not sulcated on the sutures; valves without plaits; hilum linear.

"Wight Cat. n. 750."

Specimens of Wight's No. 750 are in the herbaria at Calcutta and at Kew but no exact data as to locality are given. Two other specimens at Kew are labeled "E. India, Walker," and "Nilgherries, Gardner in 1847." In the Calcutta herbarium is a recent specimen collected by C. E. C. Fischer, No. 1651, January 23, 1910, at Karimalia, South Malabar, altitude 5000 ft.

The species is easily distinguishable by the thickish leaflets densely covered on each side with a silvery pubescence that becomes rusty in age. The calyx is similarly pubescent. No mature pods or seeds have been seen. Apparently the species is rare and restricted to the mountains of southern India.

In the light of the data disclosed by these studies the plants described by pre-Linnaean authors may with considerable confidence be identified as follows:

S. pruriens

Rumphius Herb. Amb. 5:393, tab. 142. 1747.

This description is the first cited basis for *Dolichos pruriens* L. and therefore the species must rest upon the correct identification of the Amboina plant.

S. prurimum biflorum

Parkinson Theatr. Bot. 2:1056. 1640.

Rheede Hort. Malab. 8:61. tab. 36. 1688.

under the name Nai-Corana.

Hermann Mus. Zeyl. 67. 1717.

under the name Adsarijapala.

S. prurimum officinale

Morrison Plant. Hist. Univ. Oxon. 2:69. 1680.

Ray Hist. Plant. 1:887. 1686.

Hermann Par. Bat. Prod. 364. 1689.

Plukenet Phytographia tab. CCXIV. fig. 1. 1691.

Also all other references to the American plant.

In the compilations of other pre-Linnaean botanists all of the above were referred to a single species, and this is also the case in the writings of many modern botanists.